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described and figured, *viz.: Stenopus scutellatus*, *Leander northropi*, *Alpheus hippothoë* de Man, var. *bahamensis*, *Alpheus nigro-spinatus*, and *Athanas ortmanni*. Descriptions are given also of *Uca leptodactyla* Guerin MS., *Stenopus hispidus* Latreille, and *S. semilævis* von Martens, and the two species of Stenopus are figured. The common Gonodactylus of the West Indies is mentioned under the name *G. œstedii* Hansen, although the difference between this form and *G. chiragra* Fabr. of the East Indies is very slight. R. P. B.

BOTANY.

A Monograph of the Genus Caulerpa.[1] — There is hardly any group of algæ so fascinating as the genus Caulerpa, though there is hardly any genus, certainly none among algæ of the same size, concerning which the known facts, except as to external form, are so few. A genus so distinctly marked that there is no question whatever as to its limits; containing from fifty to one hundred species, according as one takes the broader or the narrower idea of a species; the plants having a beauty, and at the same time a variety almost unrivaled, differentiated into a creeping stolon, sometimes several feet in length, roots going deep into the sand, and erect fronds, often very richly branched; and yet the whole plant consisting of a single cell. Abundant in all tropical and subtropical waters, an object of study by botanists for over fifty years, we are to-day absolutely ignorant of any form of reproduction other than by a portion of a frond breaking off and maintaining an independent existence and growth.

Not the least curious character of the Caulerpæ is the manner in which the erect fronds mimic the various higher plants. A list of the names of the twelve sections of the genus gives some idea of this; they are Vaucherioideæ, Charoidæ, Bryoideæ, Zosteroideæ, Phyllantoideæ, Filicoideæ, Hippuroideæ, Lycopodioideæ, Thuyoideæ, Araucarioideæ, Paspaloideæ, and Sedoideæ; and in the specific names this is carried still further, as in *C. taxifolia*, *C. selago*, *C. ericifolia*, *C. cactoides*, etc.

As usual in large genera, there is likely to be considerable difference of opinion as to the limits of species, especially when, as in this case, very few of the species have been seen by their authors except as dried specimens ; any one who has given any attention to the genus must recognize the difficulty of distinguishing many of the described species. With the intention of doing what was possible towards clearing up the subject, Mme. Weber-Van Bosse has made it a special study for several years, and the result is the paper just published in the *Annales du Jardin Botanique de Buitenzorg.*

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[1] Monographie des Caulerpes, par Mme. A. Weber-Van Bosse. *Annales du Jardin Botanique de Buitenzorg*, tome xv, pp. 243–401, Pls. xx–xxiv.

Two long voyages to the tropics, specially for the observation of the living plants, and a careful study of the specimens in all the great herbaria of Europe, including authentic specimens of practically all described species, have placed the author in a position to carry out the work in a way heretofore impossible ; and the paper which is the result of her studies leaves apparently little to be done in the way of classification and general arrangement of the genus. The grouping is practically the same as in Agardh's memoir of 1872 ; but the specific limits change considerably ; varieties and forms in several cases representing what were before considered good species. Agardh's paper gave sixty-four species ; De Toni's *Sylloge*, 1889, seventy-four, not including doubtful species ; Mme. Weber describes five new species, but, including these, her list is only fifty-four. Any one who has struggled to distinguish the Florida and West Indian *C. juniperoides*, *C. cupressoides*, *C. ericifolia*, etc., not from a single specimen of each, but from a lot of some hundreds, will appreciate the justice of a classification which unites under *C. cupresoides* these and four more of the older species.

In the matter of nomenclature a number of changes have been made, usually to substitute an older specific name for the one commonly received ; though in one or two cases, where this would result in the substitution of an obscure and also inappropriate name for a universally known and appropriate one, the change has not been made. The introductory chapter contains a full account of previous studies on the structure and growth of Caulerpa ; the plates are excellent ; the descriptions full ; and the synonymy very complete, so much so that the absence of any index is a matter for regret.

As to the question of fructification, there are only a few tantalizing hints : in two instances, each in a different species, an arrangement of the protoplasm similar to that which precedes the formation of spores in certain genera of green algæ ; the fact of the disappearance of certain species during certain months, and their regular reappearance ; and one or two other indications pointing to the probability of growth from spores ; these are all that we can learn. But the author is planning another voyage to the Malay Archipelago for the express purpose of studying the question of fructification, and we may hope that it then will be settled.

A New Volume of De Toni's Sylloge. — The *Sylloge Algarum*,[1] by J. B. De Toni, begun in 1889, has now reached Vol. iv, of which the first section is just issued. This volume will contain the Florideæ, arranged on the Schmitz-Hauptfleisch system, as given in Engler and Prantl. A work like the *Sylloge*, giving a more or less complete diagnosis, in its appropriate systematic place, of every published species of alga, with references not only to the original publication but also to all the important works in which the species is mentioned, saves an immense amount of time otherwise needed in looking over the very scattered literature of the algæ. It should not be forgotten, however, that the *Sylloge* is not intended to be a critical revision, and any attempt to determine species of a large or difficult genus by it would give very uncertain results. In a work of this extent, so largely references, some omissions and errors are probably unavoidable, and it is hardly safe to copy any reference without verification; but perhaps this is the only safe rule, even with the most accurate works.

Studies on Phytoplankton. — The study of the plankton, the minute animal and vegetable life distributed through the sea, at all depths, has attracted much interest recently and seems likely to have important practical results. Recent publications, by Cleve[2] and others, indicate that the pelagic flora and fauna of each great region has a character of its own, and that by observing the changing character at any given locality it may be possible to ascertain from what oceanic region the currents are flowing at the time. At certain points on the coast of Sweden, for instance, the water at one time of the year shows the characteristics of the southern part of the German ocean; at another part of the year, the characters of the Arctic and North Atlantic. That a more thorough knowledge of the laws governing these changes may give some indication of the causes of the migrations of food fishes seems not improbable; the practical value of such knowledge would be very great.

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[1] De Toni, J. B. *Sylloge Algarum hucusque cognitarum*, vol. iv, Florideæ, Sectio I, Familiæ I–IX. Patavii, 1897.

[2] Cleve, P. T. A Treatise on the Phytoplankton of the Atlantic and its Tributaries, and on the Periodical Changes of the Plankton of Skagerak. Upsala, 1897.

Cleve, P. T. Karaktäristik af Atlantiska Ocean vatten pa grund af dess mikroorganismer. Oefvers. K. Vetensk. Akad. Forhandl., Stockholm, 1897.